ABRFC Flood Climatology Graphics

Part I - Mission Connection

a. Product Description - The National Weather Service (NWS) is the agency responsible for issuing river forecasts and flood warnings for the United States. In cooperation with national, state and local agencies, as well as private organizations and the public, the NWS determines the river levels which correspond to the beginning of significant damage from high water. This level of water at a given river location is termed flood stage. The NWS issues special river forecasts and flood warnings when levels are expected to equal or exceed flood stage. The experimental Flood Climatology graphics are Internet web pages that depict the historical frequency of exceeding flood stage at river forecast locations within the Arkansas-Red Basin River Forecast Center (ABRFC) area of responsibility based on the period from 1984 to 2001.

This suite of products includes annual and seasonal graphics at both the RFC and Weather Forecast Office (WFO) Hydrologic Service Area (HSA) level. In addition, histograms of flood frequency information on a monthly and annual basis for individual river forecast point locations are available.

b. Purpose - ABRFC Flood Climatology graphics provide information concerning the frequency of exceeding flood stage. This information is not available from any other source. This information can be used by other government water resources agencies, emergency managers, the general public and NWS WFOs to obtain a general knowledge of the frequency, location and time of year that flood problems can be expected.

c. Audience - The target audience for these graphics products is wide ranging. Regional customers and partners such as the Army Corps of Engineers (COE), the US Geological Survey (USGS), Federal Emergency Management Agency (FEMA), state EMs, and river authorities have areas of responsibility that span states. These new products cover large areas and these partners can easily see the flood frequency information over a large area. Water resources managers and climatologists can also use the information as well as local Emergency Managers (EM) and the general public.

The graphics also are helpful to NWS management in the interpretation of river forecast verification statistics by providing a relative measure of the difficulty of providing accurate forecast heights at any given location. This is related to the process of calibrating the river forecast model using the observed historical record of flood events. For locations where flooding is very infrequent, few cases are available to calibrate the river forecast model accurately and thus it is more difficult to obtain a high level of forecast accuracy.

d. Presentation Format - The Flood Climatology Graphics are web-based graphics. Due to the gridded nature of data, no text presentations are made.

e. Feedback Method - We are always seeking to improve our services based on user feedback. Comments regarding the Flood Climatology Graphics should be sent to the feedback email address on the webpage containing the product. Comments may also be provided to:

Arkansas-Red Basin River Forecast Center
10159 East 11th Street, Suite 300
Tulsa, OK 74128
Attn: Billy Olsen
billy.olsen@noaa.gov

Experimental Feedback Period: June 13, 2003 through May 31, 2004

Part II - Technical Description

a. Format and Science Basis - Flood event calculation was initiated with database queries performed for each month from 1984 to 2001 for each river or reservoir station. The queries returned the number of days each river station reached or exceeded the official NWS flood stage. Flood stage at reservoir stations was defined as the top of the USACE's conservation pool. These monthly figures were then combined into seasonal and annual totals. The seasonal and annual values could then be summed and divided to generate average seasonal and annual values. In these queries, only those stations with at least 75 percent of monthly data available were used. This threshold achieved equilibrium between maintaining a high quality of data and having enough stations to generate useful results. Gridded flood duration images were generated using ArcView3.1 with Spatial Analyst. Since these interpolations were to represent conditions along individual rivers rather than an unbounded area, a procedure was developed to accurately interpolate gridded maps that describe flood conditions along the entire length of the ABRFC rivers using point data. The results from the database queries were also used to generate a number of statistics for the ABRFC as a whole and also for individual river stations. For the entire ABRFC, the averages for the number of flood days per month and the number of river stations with flooding per month were computed. For individual stations, the average number of flood days per month and flood days per year were calculated.

b. Product Availability - The Flood Climatology Graphics are static products that are always available. It is anticipated that updates to the frequency information will be made on an annual or perhaps a slightly longer update cycle. Graphics are available at http://www.srh.weather.gov/abrfc/floodclimate/index.shtml.

c. Additional Information - A complete technical description is available at http://www.srh.noaa.gov/abrfc/research/floodclimate/floodclimate.html or contact the ABRFC at the address shown in Part I, item e above.